2) Population 45 (Amarillo Bajio) 8845 Tloltizopan
Components- Inbred lines from Purdue University (USA) US13; Pfizer hybrids 347, 381, 3983, 409, 418; Hixanth; CBC Nebraska; Iowa stiff stalk synthetic; Tuxpeno; Cuban flints; Puerto Rico Composite' and collection from the Dominican Republic.

Description: This subtropical temperate. intermediate maturing Yellow dent population has a broad germplasm base. In selection, emphasis is placed on reduction of plant height.

YIELD DATA OF OBSERVATION TRIAL POPULATIONS (KG/HA)

Year		1989	1990	1990	1990	1990
location	PAKTIA	Kaghan	Swat	Swat	Swat	Swat
Variety Name		2000Masl	2000Masl	1350Masl	1200Masl	1350Masl
Across 8786			6678(2)	7988(3)		
Batah 8686		5697(1)				
845			6341(3)		6823(1)	
EV-II	(2)	3679(8)	6857(1)			
Shaheen	(3)			5977(9)	4447(11)	3128
Kissan					4941(9)	3906
Sarhad Yellow	(1)					

CALCULATION OF MAIZE YIELD AT 12% MOISTURE

1. EXAMPLE

A) Size of Harvested area = 7.5 M^2.

B) Wt of grain of above area = 9.0 Kgs.

C) % moisture based on Moisture meter = 25 %

D) Calculation :

$$\frac{9 \text{ Kgs}}{7.5 \text{ M}^2} = 1.2 \text{ kgs / M} \times 10{,}000 = 12{,}000 \text{ Kgs/Ha.}$$

Moisture Conversion From 25% to 12 %

$$\frac{100 - 25}{100 - 12} = \frac{75}{88} = 0.8523$$

Yield in Kg/Ha at 12 % Moisture =

12,000 Kgs/Ha x 0.8523 = 10,227

CALCULATION OF FERTILIZER RATES

Example 1: How much DAP and Urea should be applied per Jerib to be equivalent to 120 Kgs/Ha N and 80 Kgs/Ha P2O5.

One Jerib = 2000 M^2 = 1/5 Ha.
DAP = 18% N and 46% P2O5
Urea = 46% N

Kgs Needed

Ha	Jerib		N	P2O5
174	35	DAP	31	80
193	39	Urea	89	—
			120	80

DAP 80/0.46 = 174 Kgs DAP / Ha
174 x 1/5 = 35 Kgs DAP per Jerib
174 Kgs DAP x 18% N = 31 Kgs N

Urea 89/0.46 = 193 Kgs Urea /Ha
193 x 1/5 = 39 Kgs Urea /Jerib

Example 2 : How many Kgs/Ha of N & P2O5 result from using 50 Kg Urea and 50 kgs DAP on a Jerib?

	N	P2O5
50 Kgs DAP =	9	23
50 kgs Urea =	23	—
Total	32	23

One Ha = 5 Jerib
32 x 5 = 160 N per Ha.
23 x 5 = 115 P2O5 per Ha.

SEED MULTIPLICATION IN AFGHANISTAN IN 1992

Location : Helmond, Nangarhar, Logar

Size : Multiply One (1) Mt to 200 Mt

Land Needed At Each Region:

Seeding Rate 40 Kg/Ha

1000 Kg seed at 40 Kg/Ha = 50 Ha = 250 Jeribs

Fertilizer Needed For Each 50 Ha.Site:

Fertilizer Rate 120-80-0 Kgs/Ha N-P2O5- K2O

for each Ha need 174 Kgs DAP 193 Kgs Urea

DAP 174 Kgs/Ha x 50 Ha = 8,700 Kgs = 174 Bags

Urea 193 Kgs/Ha x 50 Ha = 9,674 Kgs = 193 Bags

Predicted Yield:

A) 4 MT per Ha x 50 Ha = 200 MT

B) 3 Sites x 200 MT = 600 MT

Seed Cleaners will be delivered to sites if available.

SEED INCREASE INSIDE AFGHANISTAN IN 1992

(First Estimation Made on August 8,1991.)

1. INTRODUCTION:

The DAI Afghan staff was asked to estimate how many Jeribs of maize increase they could arrange in their regions for 1992. They had been instructed in the methodology required for maximizing yield and for isolation. Anticipating many problem, rightly so, they reluctantly estimated that they could or were willing to attempt to increase seed on the folling scale. This estimate was made in August 1991.

2. SEED INCREASE

Region	Jeribs	* Basic Seed Needed/Kgs	** Estimated Certified Seed Produced/MT
Helmond	100	1000	80
Nangarhar	60	600	48
Logar ***	15	150	12
Total	175	1750	140

* Based on Seeding Rate of 10 Kgs/Jerib, More than one Variety

** Based on a yield of 8 Mt/Jerib

*** DAI Afghan Agent will grow it on his own land.

1991-92 MAIZE MULTIPLICATION PLAN

1. INTRODUCTION

Five experimental CIMMYT varieties and 3 varieties developed at Pirsabak are being grown in observation trials in Afghanistan. It is hoped that at last one variety and most likely two varieties at both the high elevation regions and mid elevation regions will prove adaptive. These adaptive varieties should then be distributed into Afghanistan in April 1992 for commercial production and for increase. An increase plan is essential because DAI has the only seed of the CIMMYT varieties (1 or 2 kgs) and the Pirsabak varieties are available as basic seed and arrangement need to be made to produce certified seed. This increase is not done without a contract.

2. MEXICAN VARIETY

A) Highland population;845, Across 8786, Batan 8686, Seed available = 2 kgs/population.

1. First Multiplication - Swat - 6/91 to 10-91. 2 Kgs Planted on 1/10 Ha. producing the equivalent of 4 MT/Ha = 400 Kgs.

2. Second Multiplication - Tandojam - 12/91 to 3/92. 400 Kgs planted on 20 Ha producing the equivalent of 4 MT/Ha = 80 MT.

B) Mid elevation population; 8731(Duc Trong), 8845 seed available = 1.Kg. Per population.

1. First Multiplication - Pirsabak - Summer 1991
   1 Kg planted on 1/20 ha producing the equivalent of
   4 MT/Ha = <u>200 Kgs</u>

2. Second multiplication - Tandojam 12/91 to 3/92.
   200 Kgs planted on 10 Ha producing the equivalent of
   4 MT/Ha = <u>40 MT</u>

3. PIRSABAK VARIETIES

A) Highland variety: EV-II

Should the variety prove adaptive, 400 kgs seed should be increase at Tandojam 12/19 to 3/92 on 20/Ha = <u>80 MT</u>

B) Mid- elevation; Sarhad Yellow, Kissan. DAI should contract with a private seed company or a SIA to increase either one or both these varieties on 7.5 Ha. in the summer of 1991 for distribution to Helmand, Nangarhar in April 1992.

4. Total seed available for distribution in Afghanistan in 1992 (in MT).

	Elevation	
	<u>High</u>	<u>Mid</u>
1) Based on number of Adaptive variety	80 - 160	70 - 110

1991 SEED MULTIPLICATION PLAN FOR CIMMYT MAIZE POPULATION

1. OBJECTIVE

   To multiply the CIMMYT populations that are used in both the high elevation and intermediate elevation observation Trial in Afghanistan in the event that one or more of them prove promising

2. A) CIMMYT Material for 1600 to 2200 meters A.Pop 845 "Hinalaya Amarillo." a temperature highland early yellow semi-flint

   B) Batan 8686, Highland, early, yellow, semi-flint

   C) Across 8786, Highland, early, yellow, semi-flint.

3. CIMMYT Material for intermediate (500 to 1500 M) elevations

   A) Population 31 : Yellow, semi-flint, early, Tropical/Sub-tropical.

   B) Population 45 : Yellow, semi-dent, early, sub-tropical cold tolerant.

4. Material given to Dr.Salim for observation trials or inclusion in breeding program.

   A) Population 30 : White, semi-flint, early, tropical/ subtropical.

   B) Population 33 : Yellow, semi-flint, mid-maturing, tropical/ subtropical.

   C) Population 45 : Yellow, semi-flint, early , tropical/sub-tropical.

   D) Pop 590 : Yellow, semi-flint, mid- maturing, subtropical, barer resistant

   E) Pool 29 : Yellow, semi-flint, early, sub-tropical, QMP (high Quality)

   F) 8569 : Yellow, semi-flint, early, sub- tropical, QPIt, High yielding.

5. METHODOLOGY:

The three CIMMYT population for high elevation will be grown in Swat valley. Seeding rate will be 15 Kgs/Ha for a population of 40,000 plots/Ha. For each Kg of seed an area of 667 M^2 is needed. There are 2 Kgs of seed available so there isolation plot of 1330 M^2 will be used. Fertilizer will be applied at the rate of 200-100-0. Each 1330 M^2 plot should receive 6 kgs DAP and 11 Kgs Urea, including timely irrigation, weeding and pest control. Assuming a yield of 6 MT/Ha each plot should yield 800 Kgs of seed.

The two CIMMYT populations for the intermediate elevation pop 31 and pop 45, will be multiplied at two isolation sectors at Pirsabak station. There are only one Kg of seed of these two populations. Plot size will be 667 M^2 each. Assuming a yield of 6 MT/Ha each plot should yield 800 Kgs.

When the yield data becomes available from the observation plots in Afghanistan decisions can be made to increase one or more of these populations in the spring at/around Pirsabak.

This second multiplication, assuming a yield of 5 MT/Ha; can be multiplied to the following amounts:

1) 845, Batan 8686, Across 8786 (800 Kgs)=200 MT

2) Pop 31, Pop 45 (400 Kgs) - 100 MT

BACKUP MAIZE SEED MULTIPLIED BY A PRIVATE SEED CO. OR A SEED IMPROVEMENT ASSOCIATION.(SIA)

1) August, 1991

A) INTRODUCTION

Observation trials in Afghanistan are being conducted to determine which varieties should be multiplied for distribution in Afghanistan. The results of these trials will be available October, 1991.

B) RATIONAL

There are four reasons to multiply seed of Pakistan varieties before the results of the observation trials in Afghanistan are available in October 1991.

1. The amount of seed which can be produced in the winter 1991-92 at Tandojam of the CIMMYT material is not sufficient to meet the demand.

2. The multiplication of the CIMMYT material goes amiss i.e. flood, locust, disease, PAK-INDO WAR, etc.

3. CIMMYT material is not adaptive nor acceptable to Afghan farmers as determined by response to the observation trials.

4. Private seed Co's must be informed by August 10, 1991 of our needs in order to multiply this summer. If informed later the seed would be multiplied in the spring in Pakistan and would not be available until July 1, 1992 which would be too late for distribution in Afghanistan.

1991 DAI-AASSP Maize Observation Project

This Maize improvement plan was developed after consultations with US Highland maize scientists, CIMMYT staff, Pirsabak Maize personal, and scientists who worked in Afghanistan prior to 1979.

It is universally agreed that the Afghan farmers seed an early, yellow, flint maize for both the high and intermediate elevation zones of Afghanistan. What is early in Peshawar will be late maturing at 2000 meters. A supply of seed of a variety which has tested adaptive at the 2000 meter level in Afghanistan is not available . SARHAD yellow was tested in Paktia Province and found late maturing but it may be acceptable at a lower elevation. Two other white varieties, EV-II and Shaheen were acceptably early in some locations in the intermediate zone. KISAN, also a white variety, has proven high yielding in sections of the lower elevation.

CIMMYT has made available populations in experimental qualities (3-5 Kgs) of highland and intermediate seed for observation trials and multiplication.

The DAI - AASSP Project will establish 20 observation trials at the 1600 to 2200 meter elevation using 3 CIMMYT populations plus EV-II and a local check. At the same time have 2 Kgs of the 3 CIMMYT populations multiplied in Swat in isolation.

20 observation trials will be established at 500 to 1500 meter elevation using 2 CIMMYT population plus 2 pirsabak varieties and a local check. 1 Kg of the 2 CIMMYT population will be multiplied at pirsabak.

C) RECOMMENDATION

It is recommended that DAI contract with a private seed company or seed association to produce 25 MT of Sarhad Yellow and 5 MT of Kissan White (for Nangarhar) for distribution in Afghanistan in Apirl 1992.

2. June - September 1992.

A) INTRODUCTION

Assuming that one or more of the CIMMYT experimental populations that are now in observation trials in Afghanistan, prove to be adoptive, then it will be necessary to set up a system guaranteeing a source of pure basic seed year after year. This basic seed will be multiplied each year in or out of Afghanistan for release to farmers. It would be safer to set up a system with a Pakistan seed improvement association, than to try to set up a system inside Afghanistan.

B) RECOMMENDATION

As soon as the result of the 1991 maize observation trials are available some time in October 1991, that DAI start negotiation with a private seed company or a SIA to set up a system to maintain a source of basic seed. The varieties will be selected in October 1991. The amount of basic seed to be maintained will by established yearly. High elevation varieties should be multiplied in isolation above 1300 metrics. The lower elevation varieties in the plains of Pakistan.

It is estimated, for each variety chosen in November 1991,that 100 kgs seed be given to the SIA or seed Co. The SIA would increase 2000 kgs of certified seed for distribution to seed increase farmers in afghanistan in April 1992. The Afghanistan seed produces would then increase the 2 MT to 400 MT of each variety for commercial production in 1994. The SIA would always maintain 100 kgs reserve.

Each year the demand for seed would be estimated and increases would be calculated accordingly.

1992 Maize Grain - Fodder
Demonstration Trial For Afghanistan

1. PURPOSE:

Afghanistan farmers traditionally seed maize at high populations and then thin out plants for fodder at least up to tassel. This trial will compare the farmer method with a plot that maximizes grain and 3 plots of forage grasses.

2. METHOD:

Plot Size : 12M x 50M = 600 M^2 = 0.3 Jerib.

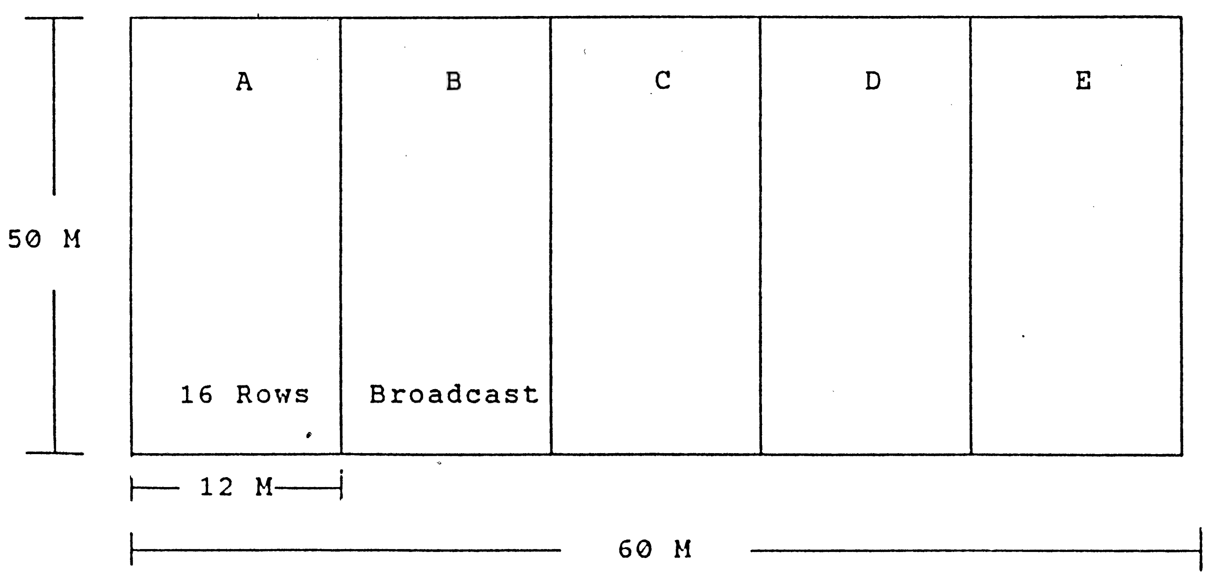
Trial Area: 600 M^2 x 5 plots = 3000 M^2 = 1.5 Jeribs.

Fertilizer Rate: 107 N and 77 P205 /Ha = 50 Kgs DAP And 50 Kgs Urea/ 3000 M^2

Fodder Measurements: Taken as Kgs green wt at time of harvest.

Grain Measurements: Taken as Kgs per plot A and B at 12% moisture

3) PLOT PLAN:



4) TREATMENTS:

A) Maize Grain Maximization

1) Improved Seed Variety, Seed Rate based on 5 Kgs per Jerib (25 Kgs/Ha = 5 x 0.3 = 1.5 Kgs Seed /600 M^2

2) 16 Rows, 75 CMs apart, Plants 25 CMs apart in Rows

B) Traditional Maize Grain Fodder

1) Farmer Variety, Seed Rate based on
15 Kgs/Jerib = 15 x 0.3 = 4.5 Kgs /600 M^2

2) Seed Broadcast

3) Farmer Thins Plants for Fodder in Traditional Way.

C) Sudan x sorghum Hybrid

1)

D) Wide Leaf Forage Oats

1)

E) Maize Fodder

1) See Instructions in Appendix No.

MAIZE GRAIN - FODDER DEMONSTRATION

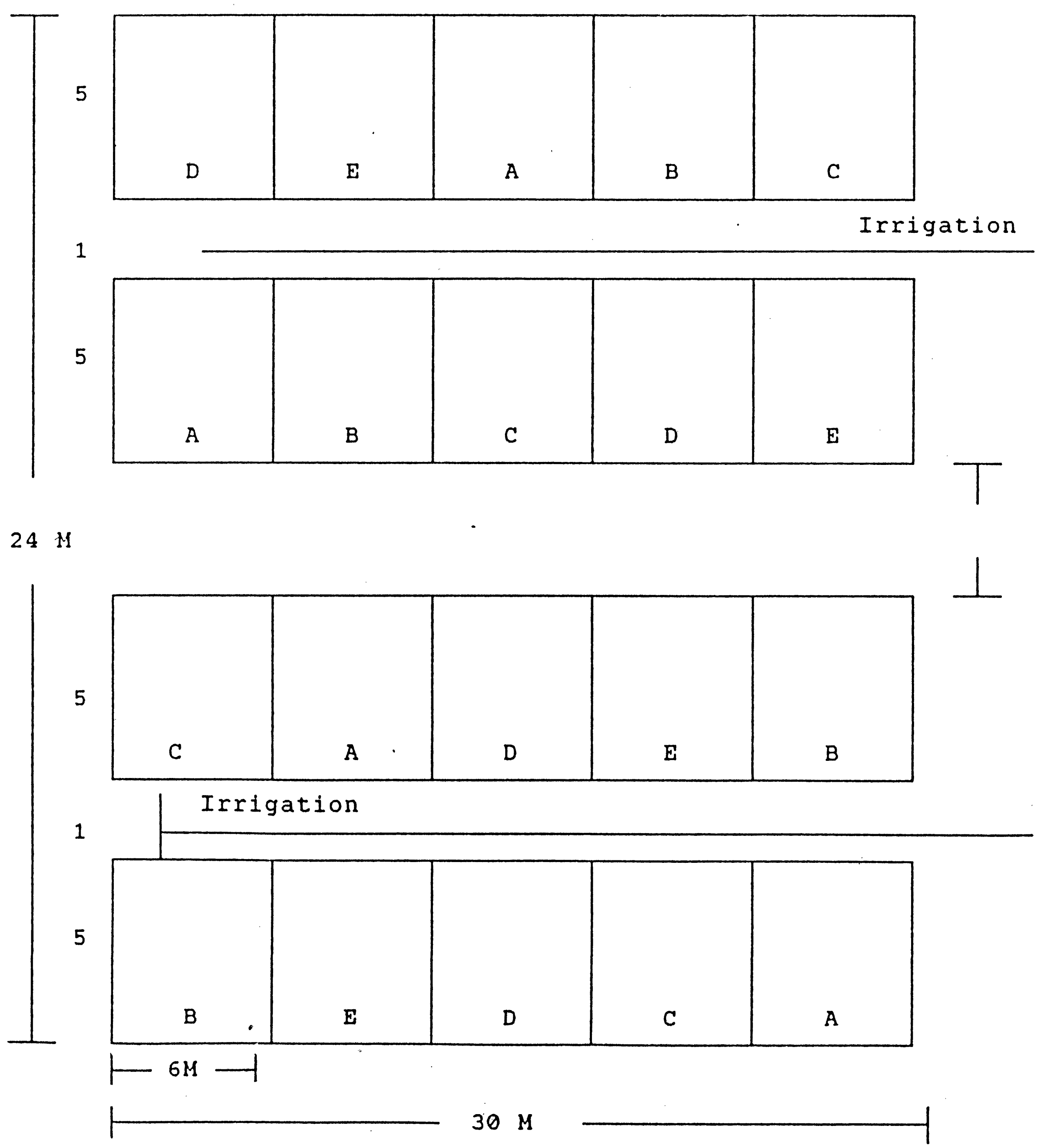
Peshawar University Experimental Farm

1. PURPOSE

Afghan farmers traditionally seed maize at high populations and thin out plants for fodder up to the time of tassel and sometimes beyond depending on the shortage of fodder for their livestock. Growing maize for grain and fodder will reduce the grain yield because of the competition of the fodder. This trial is being conducted to determine whether separate fields for fodder and grain may produce more than multi purpose systems.

2. PLOT PLAN

Location is Peshawar University Experimental Farm.
Summer, 1991.



3. METHODOLOGY

A) Plot Size : 5M x 6M , Rows 75 cm. apart = 30 M^2

B) Trial Size : 24M x 30M = 720 M^2 = 0.072 Ha.

C) Fertilizer : 120N + 80 P2O5 Kgs/Ha. = 12.5 Kgs DAP and 14 Kgs Urea per 720 M^2 applied and worked in before seeding.

D) Treatments : 5 Treatment x 4 Replications = 20 Plots

1- Treatment A: Traditional Maize Grain - Fodder

a) Sarhad Yellow Variety: Seed Rate based on 15 Kgs/Jerib = 0.225 Kgs Seed/Plot.

b) Seed Broadcast and Plot Flood Irrigated.

c) Thin plot for fodder weekly up to time of silk until population equals 11,000 plants per Jerib or 165 plants per plot.

2- Treatment B: Grain Maximization

a) Variety: Sarhad Yellow, Seed Rate approx. 4 kg./Jerib.
8 rows 75 cm apart, seeds 25 cm apart in row thinned to 1 plant 25 cm apart when plants are 30 cm tall. Need approx. 75 gms seed/ plot.

3- Treatment C: Maize Fodder.

a) Variety: Sarhad Yellow, Seed Rate 15 kgs/Jerib, 12 rows 50 cm apart, seed 10 cm apart in the row. 225 gms seed per plot.

b) Harvest 1/8 of the plants weekly starting 30 days after planting for 8 weeks.

4- Treatment D: Sudan Sorghum Hybrid

5- Treatment E: Control

E. Yield Data.

Harvest forage according to instructions for each treatment. All forage is to be recorded as green weight at time of harvest. Record as Kgs. and date of harvest for all four replications.

Treatment A+B: Harvest Maize ears when mature, shell, determine % moisture on a meter, and take weight of grain. Record plot weight as 12 % moisture. Harvest stalks and record as final forage weight.

1992 MAIZE VARIETY OBSERVATION TRIALS

1. OBJECTIVE : To conduct trials in regions of Afghanistan not included in 1991 trial in order to determine the most adaptive varieties.

2. POSSIBLE LOCATION : Baghlan, Takhar, Paktia

3. VARIETIES : Two improved varieties plus a local = 3

4. METHODOLOGY:

   A) Plot size = 20 x 10 M = 200 M = o.1 Jerib

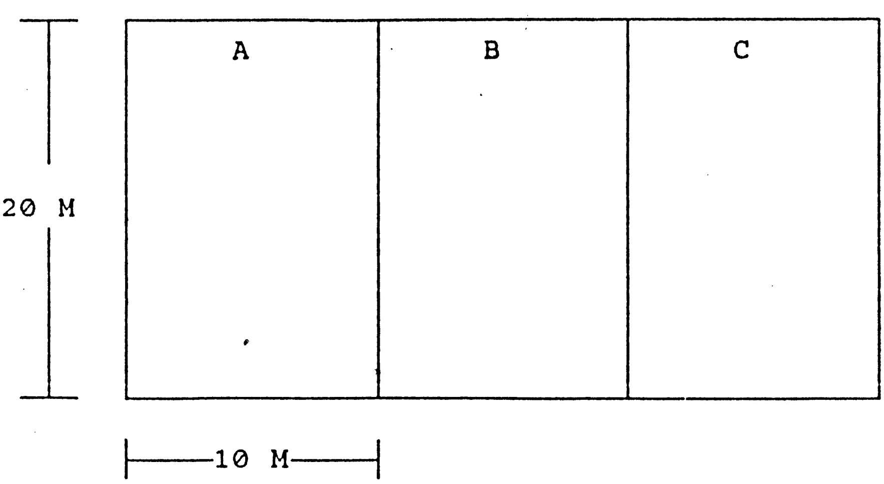
   B) Trial Size = 200 x 3 = 600 M2 = 0.3 Jerib

   C) Fertilizer = Apply 10.5 Kgs DAP and 13.5 Kgs Urea to trial area prior to seeding.

   D) Seed in rows 75 cms apart at the rate of 5 Kgs/Jerib= 0.5 Kgs per variety.

   E) Thin to 4 plants per meter row when plants are 20 to 40 cms high.

5. PLOT PLAN:



1992 MAIZE VARIETY INTRODUCTION INTO AFGHANISTAN

1. OBJECTIVES

To introduce the most adaptive varieties from the 1991 observation trials to farmers in the principal maize growing areas.

2. METHODOLOGY

Seed and fertilizer will be provided gratis to selected farmers for a one Jerib demonstration trail. The farmer must agree to use the improved package of practices including the following:

A) Seeding rate of 5 Kgs/Jerib

B) Row plating on rows 75 cms apart and either ridge planting or ridged up at first weeding.

C) Apply 35 Kgs DAP and 38 Kgs Urea per Jerib before seeding.

D) Thin to an average of 4 plants per meter row where plants at 20 to 40 cm hight.

3. LOCATION OF TRAILS

A) Ten trails at Helmond, Kandahar, Nangarhar and Logar.

B) Two trails at Ghazni, Wardak, Paktika, Parwan

C) Total Trials = 48

4. TOTAL SEED AND FERTILIZER NEEDS

A) Seed (more than our variety) 5 x 48 = 240 Kgs

B) Fertilizer = DAP - 35 Kgs x 48 = 1680 Kgs
Urea - 38 Kgs x 48 = 1824 Kgs

A) ROW PLANTED

B) BROADCAST

<u>Recommendation For Afghan Farmers</u>

1. Variety (A+B) For both row planted and broadcast. Use the recommended/ available improved variety in your region. Pick a variety that will mature in the time period available in the rotational scheme planned.

2. SOIL PREPARATION

   A+B) Plow the field and break up the clods until there is a weed free, level seed bed. ADD DAP + Urea. Work into soil. Irrigate.

3. FERTILIZER

   1/2 bag DAP + 1/2 bag Urea per Jerib.

4. SEEDING

   A) For Row Planted
   Mark out rows 75 cm apart. plant seed 25 cm apart or closer at 2 cm depth

   B) For Broadcast
   Broadcast at the rate of 8 kgs/Jerib and cover lightly.

5. CUT WORM CONTROL (IN AREAS OF HEAVY INFESTATION)

   A) In rows planting, apply dieldrin at the recommended dosage at the time of planting as close to the seed as possible.

   B) For Broadcast planting
   Difficult to control so accept loss in high population crop.

PLOT ESTABLISHMENT AND MAINTENANCE

A) PLOT LAYOUT

Pick a level 5m x 15m area with a reliable water supply. Have the farmer cultivate the soil traditionally until it is level, weed free, and clod free. Apply the 1.25 Kg DAP and 1.50 Kgs Urea and cultivate in.

1. Stake the corners.
2. Stake the 15M sides at 75 cms intervals, thus marking out 20 rows.
3. Run a line along each row with 11 knots 50cms, a part to mark the hills. Plant 3 seed/hill. Plant 4 rows per population.
4. Varieties are provided for 4 plots and are labeled A through D. E plot will be a local check supplied by the cooperator.

B) PLOT MAINTENANCE

1. When plant are 10 cms tall, thin to 2 plants/hill use thinning to fill in missing hills.
2. Keep plot weed free
3. Ridging. the plots are planted on the level but should be ridged up from between the rows toward the plants so that the plants are not sub-merged when irrigated.
4. Irrigate before plants wilt severely. Keep soil moist during silking to keep RH high. Drought stress at silk will reduce pollination and cause unfilled ears.

6. STALK BORER CONTROL

A+B) When the plants are 40 to 50 cm tall apply granular insecticide (Floradan - Ripcord- etc) at recommended rate to the plant whorl or spray the plants with a systemic insecticide. These usually provide 6 weeks protection.

7. WEED CONTROL AND HILLING UP.

A) At the first weeding, the row should be hilled up. This will create the rows for irrigation and will reduce lodging of plant later. A second weeding may be necessary before the crop shades out further growth of weeds.

B) For Broadcast
Difficult to weed without rows but weeds should be removed at time of thinning.

8. THINNING

A) For Row Plantings
Thin to four plants per meter row during 1st month of growth. This will be equivalent to 11,000 plant per Jerib.

B) For Broadcast
Thin down to 11,000 plants per Jerib by the time of tassel.

9. IRRIGATION

A+B) Should be irrigated at two critical times, 1) one before planting to insure a uniform germination and emergence and 2) at the time of silking to insure pollination. The crop should be irrigated whenever wilting occurs before noon.

MAIZE CROPPING PATTERN IN AFGHANISTAN

Region	Preceeding Crop	Planting Date	Harvest Days	Crop* Days	Following Crop
Helmand	Wheat fallow	6- 1/30	10-20/30	1) 130 2) 150	Wheat 50% Fallow Clover
Marouf	Wheat	6- 20/30	10-10/20	1) 110 2) 120	Wheat
Nangarhar	Wheat (Harvested 5-15	7- 1/15 (Pest Driven)	10-10/20	1) 100 2) 110	Wheat Clover
Ghazni	Fallow	5 -20/ 6 - 5	9-20/30	1) 115 2) 130	Wheat
Wardak	Clover Fallow	5 -20/ 6 - 10	9-20/30	1) 115 2) 130	Wheat
Logar	Clover Wheat	5-20/6-5 6- 5/20	9-15/25 9-15/25	1) 105 2) 125	Wheat
Takhar	Wheat	5- 5/20	9-10/20	1) 120 2) 135	Wheat

* 1) Based on Median of Planting + Harvest Days.

2) Based on 1st of Planting and End of Harvest.

1992 MAIZE SEED REQUESTS FOR VARIOUS DISTRICTS

For April - June 1992.
Estimates Made in August 1991

1. INTRODUCTION

The DAI Afghan staff made the following estimates of the number of Jeribs of land that could be grown to improved maize. The traditional seeding Rate in Afghanistan varies from 50 - 85 Kgs/Ha or 10 -17 Kgs/Jerib. The following tabulation for Kgs needs in based on 10 Kgs/Jerib which is considered 2.5 x the recommended rate for a perfect stand for grain production. The Helmond agent stated that farmers would plant at 4-5 Kgs/Jerib if they has planters.

2. SEED ESTIMATE FOR YELLOW MAIZE

Region	Jeribs **	MT/Seed	Variety *
HELMOND	40,000	400	
LOGAR	2,000	20	
MAROUF	200	2	
GHAZNI	200	2	
WARDAK	250	1.5	
Total	42,550	425.5	

3. SEED ESTIMATES FOR WHITE MAIZE

Region	Jeribs	MT/Seed	Variety
NANGARHAR	10,000	100	

* Variety : Will be determined after observation trial results.

** Jeribs : Will be revised in Jan 1992

Traditional Seeding rate vs recommended

The lowest present rate of broadcast sowing is 15 Kgs. per jerib or 75 kgs per ha. This is equivalent to sowing 225,000 seed per Ha. assuming that only 50% of the seed produce plants after being planted, that still equals a population of 112,500 plants/ha. or twice the population recommended for optimum grain production. The farmers will thin out the stand during the course of the growing season and use the thinned plants as fodder. However the over population acts as competition (weeds) and reduces grain yield. the farmer sacrificing grain for fodder.

When drills are available, it is recommended to plant 4 kgs/jerib or 20 kgs/ha. Which will be equivalent to 60,000 seed/ha and assuming a 10% mortality rate, a population of 54,000 plants/ha. Should the farmer need forage, a separate fodder field can be established using a local variety.

This practice would extend the hectarage covered by improved variety by 3.75 times.

INSECT + DISEASE IDENTIFICATION :

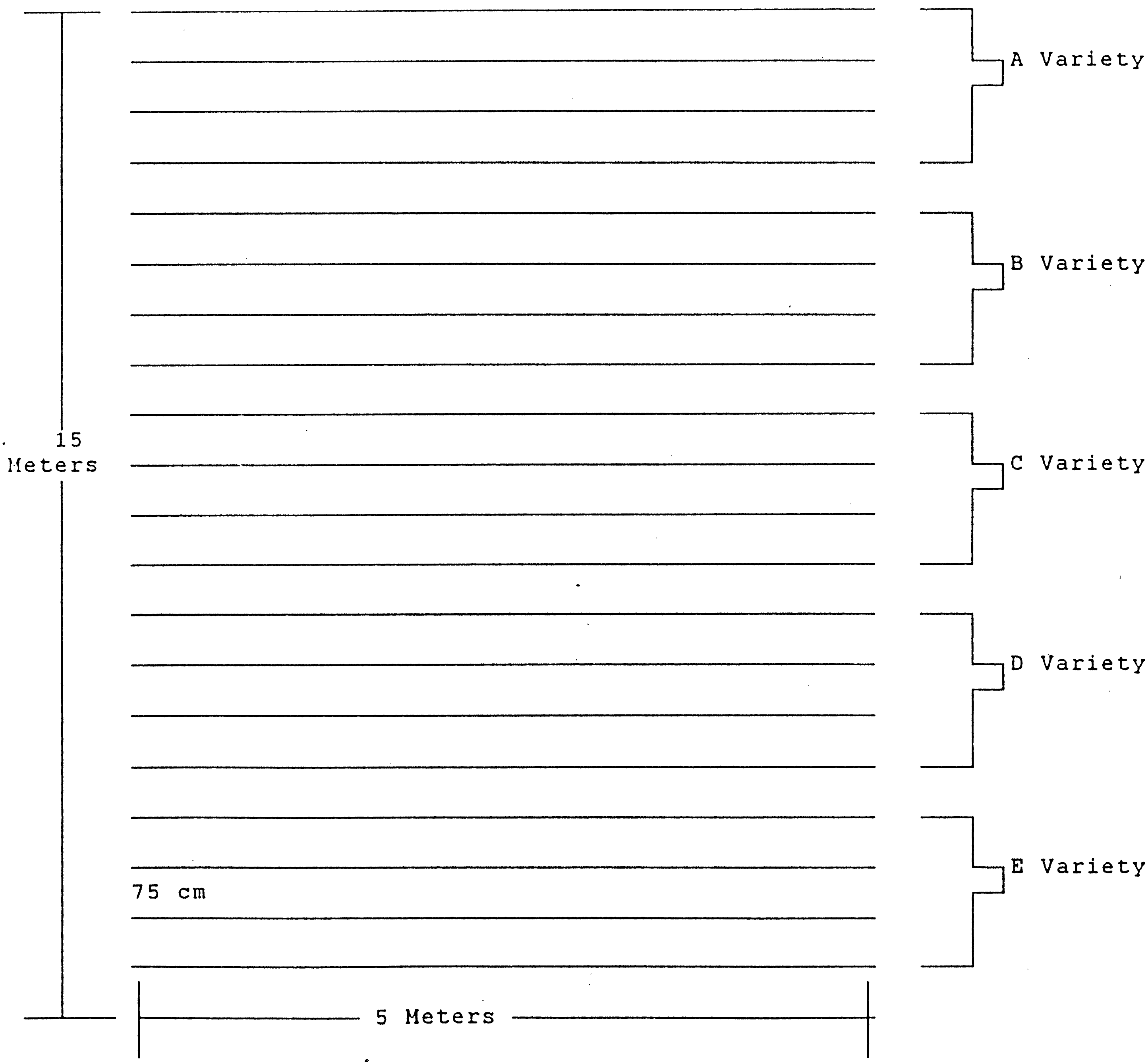
To identify major pest or disease, collect a sample of the diseased plant or the insect and bring it to Peshawar. Dr. Salim or one of his staff at Pirsabak will identify during the August Training Session.

Training :

Unfortunately there will be no training of Afghan cooperators until August when they will be called to Peshawar. By then all plots will be established. It is important that someone is left in charge during the cooperators absence to weed, protect, irrigate, and to take date of silk data.

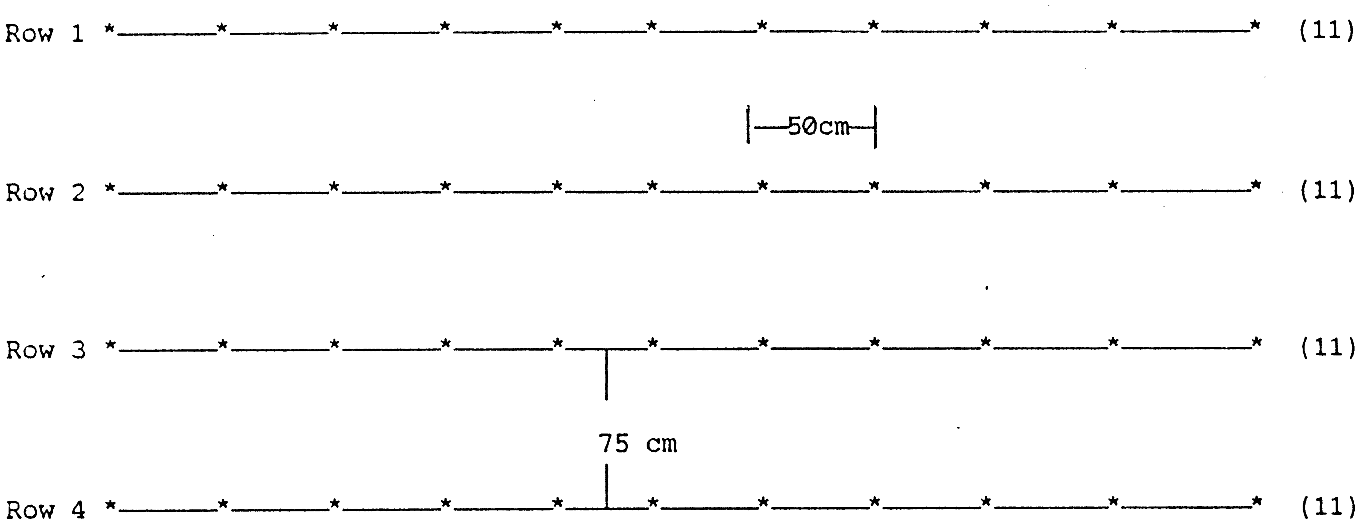
In August a two day training course in all aspects of maize trial management will be conducted at Pirsabak. Attention will be directed toward the proper procedure for determining grain yield and the use of moisture meters.

Plot Plan



Trial size: 5 x 15 = 75M2
Fertilizer rate: 120 -80-0
DAP + Urea for Trial = 1.25kgs DAP + 1.50 kgs Urea

Sub Plot Layout for each Variety



Row length = 5 Meters, 75cm between rows

No of Rows = 4 (Harvest 2 center Rows)

Hill spacing in row = 50 cm = 11 Hills per row

Seed rate = 3 seed/hill, Thinned to tow

Population = 22 plants per row = 53,000 plants /ha.

* = Hill of 3. Seeds.

High Elevation Location

No.	Province	District	Approximate Elevation	No. of Trails	Responsible	Transfer & Date	
1.	Kandahar	Maruf	1700 M	3	Wali Mohammad	Quetta	5.21.91
2.	Ghazni	Andar	2100 M	3	Ghulam Esahn	Habid Rahman	
3.	Ghazni	Asphandi	2100 M	3	Payanda Mohd	Habib Rahman	
4.	Paktika	Sharan	2150 M	3	Abdul Jabar	Habid Rahman	
5.	Logar	Baraki	1900 M	3	Wali Ahmad	Wali Ahmad	
6.	Logar	Charkh	1900 M	3	Mohd. Daud	Mohd. Daud	
7.	Parwan		1600 M	2	Mohd Anwar		
8.	Swat			1			
				21			

INTERMEDIATE ELEVATION LOCATIONS

No.	Province	District	Approximate Elevation	No. of Trails	Responsible	Transfer & Date	
9.	Nangarhar	Dar-i-Noor	550 M	4	Mohd Hassan	Mohd Ayub (brother)	5.21.91
10.	Helmand	Shamalan	750 M	4	Mohd Karim	Quetta	
11.	Helmand	Darveshan	750 M	4	Mohd Masoom	Quetta	
12.	Kandahar		1000 M		?	Aborted	
13.	Kandahar	Khwaja Mulk	1000 M	4	Shir Ahmad	Quetta	
14.	Kandahar	Khwaja Mulk	1000 M	4	M.Arif		
15.	Pirsabak			1			
				21			

* Fighting going on and may have problems getting trial in.

1991 DAI-AASSP MAIZE OBSERVATION TRIAL

NAME OF EXPERIMENT: INTERMEDIATE ELEVATION (500 - 1500 M)

LOCATION:

PROVINCE: ______________________ VILLAGE SITE: ______________

DISTRICT: ______________________

ELEVATION: ______________________

RESPONSIBLE PERSON:

OBJECTIVE: TO FIND MOST ADAPTIVE VARIETY(S).

METHODOLOGY:

1 - VARIETAL NAME
A = POP 31
B = POP 45
C = KISAN
D = SARHAD YELLOW
E = LOCAL

2 - Rows per plot = 4 (HARVEST 2 MIDDLE ROWS)
3 - Plot Size = 5M x 4 x 0.75 = 15M2 (HARVEST) 7.5 M^1)
4 - Trial Size = 5M x 20 x 0.75 = 75M2
5 - Fertilizer Rate = 120 - 80 - 0
6 - Planting Date = ________________
7 - Harvest Date = ________________
8 - No. of Irrigations = ________________

1991 DAI-AASSP MAIZE OBSERVATION TRIAL

NAME OF EXPERIMENT: High Elevation (2000M)

LOCATION:

PROVINCE: ______________________ VILLAGE SITE: ______________

DISTRICT: ______________________

ELEVATION: ______________________

RESPONSIBLE PERSON:

OBJECTIVE: TO FIND MOST ADAPTIVE VARIETY(S).

METHODOLOGY:

1 - VARIETAL NAME
 A = 845
 B = BATAN 8686
 C = ACROSS 8786
 D = EV-II
 E = LOCAL

2 - Rows per plot = 4 (HARVEST 2 MIDDLE ROWS)
3 - Plot Size = 5M x 4 x 0.75 = 15M2 (HARVEST) 7.5 M^1)
4 - Trial Size = 5M x 20 x 0.75 = 75M2
5 - Fertilizer Rate = 120 - 80 - 0
6 - Planting Date = ________________
7 - Harvest Date = ________________
8 - No. of Irrigations = ________________

DESCRIPTION OF MAIZE VARIETIES FROM MEXICO

A. For High Elevation = 1600 - 2200 M

1) Population 845 "Himalaya Amarillo" Temperate Highland Early Yellow Semi-dent. Germplasm used to form the population was largo del Dia, CIMMYT Highland Population 86 and 88, New Zealand Hybrids and synthetics containing a mix of Highland and temperate germplasm, northern U.S. Corn Belt inbred lines, hybrids, and population, and northern European inbred lines and hybrids. selection emphasis is for earliness, photoperiod insensitivity, resistance for foliar disease (*P. sorghi* and *H. turcicum*) and ear rots, Yield, and resistance to lodging.

2) Across 8786 and Baton 8686

Population 86 highland Early Yellow Semi-dent. This population contains more germplasm exotic to the tropical highlands than the corresponding pool. pool 11A. Consequently, it has a much better plant type but less cold tolerance. It performs best in tropical highland environments with mean growing season temperatures of 15-17 oC. About 35% of the germplasm, originated int he tropical highlands, 25% of the germplasm originated in the tropical highlands, 25% was temperate germplasm from the U.S corn belt, and 20% was subtropical/ Tropical. Selection emphasis is for high grain yield, drought tolerance, cold tolerance, and good agronomic type with special emphasis on non tailoring and standability.

B. For Mid Elevation - 500 TO 1500 M

1) Population 31(Amarillo Cristalino -2) 8731 Duc Trong
Components- Ninety six families from cycle 8 of compuesto to selection precox (derived from the early fraction of all of CIMMYT's tropical. late maturing populations). Crosses of tropical x temperate materials, and four families from cycle 6 of pool 17.

Description: This tropical/Sub tropical, early maturing, yellow flint to semi-flint population has relatively short plants. Since 1980 it has been undergoing selection for downy, mildew resistance by Thailand's national maize program under the coordination of CIMMYT's Asia regional maize program.

.... APPENDIX ....

1. 1991 DAI-ASSP Maize Observation Project
2. Description Of Maize Varieties From Mexico
3. Calculation Of Maize Yield At 12% Moisture
4. Calculation Of Fertilizer Rates
5. Seed Multiplication In Afghanistan In 1992
6. Seed Increase Inside Afghanistan In 1992
   First Estimation Made On July 8,1991
7. 1991-92 Maize Multiplication Plan
8. Backup Maize Seed Multiplied By A Private Seed Co, Or Seed Improvement Association (SIA)
9. 1992 Maize Grain - Fodder Demonstration Trial For Afghanistan
10. Maize Grain - Fodder Demonstration, Peshawar Univ. Summer Of 1991
11. 1992 Maize Variety Observation Trials
12. 1992 Maize Variety Introduction Into Afghanistan
13. Recommendation For Afghan Farmers
14. Maize Cropping Pattern In Afghanistan
15. 1992 Maize Seed Requests For Various Districts

AFGHANISTAN AGRICULTURAL SECTOR SUPPORT PROJECT

PRIVATE SECTOR AGRIBUSINESS (ASSP/PSA)

MAIZE PROGRESS REPORT

Prepared for

OFFICE OF THE AID REPRESENTATIVE
FOR AFGHANISTAN (O/AID/REP)

Prepared by

Edward Rice, Ph.D.

August 1991

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
Contract No: 306-0204-C-00-9829-00

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DAI/ADT MAIZE PROGRESS REPORT -8/1991

By Dr.Edward Rice

1. INTRODUCTION

When the maize project was first initiated in early march 1991, DAI staff had determined that the Afghans, for the most part, wanted maize for food and preferred a yellow , flint type. The crop had to fit in a rotation with wheat as the main crop and therefor earliness (short growing season) was also necessary . Hybrids, which need new seed each year, were not considered appropriate so open pollinated varieties were sought. It is known that a variety which takes 110 days to mature at 100 Masl may take 140 days at 2000 Masl. To take elevation into consideration, it was decided to search for material for mid elevation (500- 1500 Masl), and highland (1600-2200 Masl).

2. PROGRESS TO DATE

A) March - May 1991

1. Search for appropriate germplasm. The first decision that was taken, where there was complete agreement, was that the varieties within the various regions in Afghanistan had out crossed and had degenerated into shorter low production material. Without any facilities within the country to work on maize improvement our first task was to find material that adapted to the various regions without any further genetic manipulation. In other words, there was not time nor facilities for plant breeding activities.

   After contacting US maize scientist and visiting CIMMYT in Mexico where yield data was examined from around the world, a number of CIMMYT experimental populations were agreed upon for both the highland and mid- elevation regions. Only 2 or 3 Kgs, of seed of each population were available. Upon arrival in Peshawar from Mexico, meetings were arranged with Dr Salim, the principal maize improvement officer at Pirsabak and additional material was added to the list of potentially adaptive varieties.

The following action plan was advised:

One kg of seed of each of 4 varieties was used in an observation trial which was to be conducted in 20 locations in the Highlands (1600- 2200 Masl) and 4 varieties at 20 location at mid elevation(500-1500 Masl). The results of these observation trial will be available in October and at that time a decision can be made whether any of the varieties are adaptive to the regions and acceptable to the farmers.

There was 2 Kgs of seed of 3 CIMMYT highland varieties and only 1 Kg of seed of 2 CIMMYT mid- elevation varieties. A plan was prepared to multiple the highland varieties in Swat in Isolation and to increase the 2 mid- elevation varieties at Pirsabak. A contract was prepared with Pirsabak making Dr. Salim responsible for these multiplications.

B) June- July,1991

All the observation trials plus the required fertilizer and the instructions were delivered to the staff in Afghanistan and all 40 trials were planted.

The multiplication sites were located and the plots were established in Swat and at Pirsabak.

C) July - August,1991

The 20 DAI/ADT field staff, who are responsible for the extension activities within Afghanistan, came to Peshawar for a month of training. They were given instruction on field plot technique including data collection. Each were shown how to use a portable moisture meter and each office was supplied with a meter. The field staff also made preliminary estimates of the 1992 seed requirement for each province represented and also supplied estimations of the amount of seed increase that they were willing to undertake in 1992. These estimates are found in the appendix .

Ronco has been instructed to increase 30 Mt of two Pirsabak varieties for May 1992 distribution into Afghanistan.

3. ACTIONS REQUIRED IN THE FUTURE:

A) September, 1991

The varieties being observed in Afghanistan are not available in commercial quantities in Pakistan without contracting for their increase. There is basic seed of the varieties developed at Pirsabak which can be increased. DAI has the only seed of the CIMMYT material and therefore must devise a plan to increase those varieties that prove to be adaptive and also make a system to maintain a supply of basic seed for annual increase. Seed increase in quantities necessary for estimated demand in Afghanistan should be set up in the private sector and an attempt should be made to steer it toward a commercial setting. Hopefully, then it can be sustained beyond the life of the DAI project.

There are two entities that have the capability to increase seed for the Afghans: The private seed company and seed improvement associations(SIA) in Pakistan. DAI/ADT must explore what role either or both will play. Of immediate concern is the need to make arrangement for the CIMMYT varieties and possibly the Pirsabak varieties to be increased in or around Tandojam as soon as the increase fields in Seat and Pirsabak are harvested.

B) October, 1991

The observation trials in Afghanistan will be harvested and the data collecting . This data plus the farmer's evaluation of the varieties will be forwarded to DAI/ADT. This data will be analyzed and a decision will be made concerning which varieties were adaptive and which were acceptable to the farmers. The worst case senario would be that none were acceptable and the best senario would be that one variety at the highland elevation and one at the mid- elevation were distinctly best in which care only two varieties would need to be increased at Tandojam in November.

The seed increase fields at Swat and Pirsabak will be harvested. The estimated quantity of seed is 400 kgs of the 3 varieties grown in Swat and 200 Kgs of the 2 varieties grown at Pirsabak.

C) November - December 1991

The seed increase at Tandojam will be established in November and DAI/ADT staff will visit in December to ensure that maximum yield is being attempted and that proper isolation is being maintained.

D) January - February 1992

This is the period for the winter training of the Afghan field staff. The staff had been asked to determined what the demand was for maize seed and to review their August 1991 estimation. They were also asked to consider the magnitude of seed increase they were capable of managing and to revise that earlier estimate also.

The DAI training staff will have prepared visual aids for the training session including slides and field demonstrations.

E) March - April 1992

During this period the seed being increased at tandojam will be harvested and segregated into units for distribution, trials, and further increase. Also the 30 MT seed multiplied by the private seed Co. will be readied for transporting into /Afghanistan

Trials will be prepared and a distribution plan put into motion. The 1992 seed increase plan will be finalized and contracts signed with the responsible parties.